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THORLABS

LDC400 - FEB 27, 2017

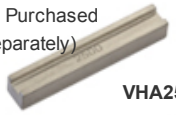
Item # LDC400 was discontinued on FEB 27 2017. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

VYTRAN™ FIBER CLEAVERS FOR Ø80 MM TO Ø1.25 MM CLADDING FIBERS

- **Cleave Glass Fibers with Cladding Diameters from 80 µm to 1.25 mm**
- **Accepts SM, PM, MM, Photonic Crystal Fiber, Capillary Tubes, Non-Circular Fiber, and Other Specialty Fibers**
- **Programmable Cleave Parameters**

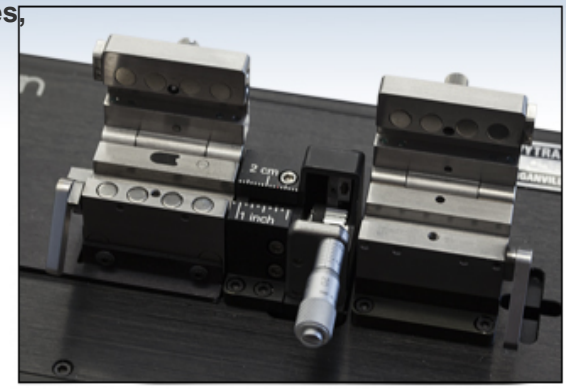
LDC400A
Fiber Cleaver with Rotation Module for Angled Cleaves

Top and Bottom Fiber Holder Inserts (Must be Purchased Separately)



VHA25

VHE25



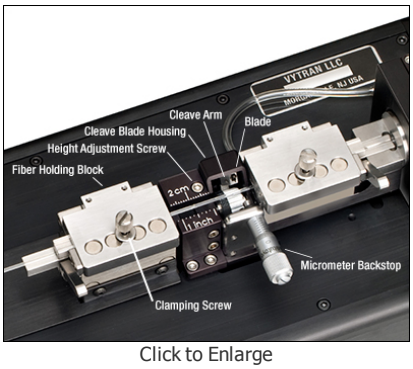
Close-Up View of the LDC400 Showing the Fiber Holding Blocks, Ruler for Cleave Alignment, and Micrometer Backstop

vytran™

OVERVIEW

Features

- Cleave Glass Fibers with Claddings from Ø80 µm to Ø1.25 mm
- Flat Cleaves or Angled Cleaves up to 15°
- Programmable Processes for a Wide Variety of Fibers:
  - SM, MM, and PM Fibers
  - Capillary Tubes*
  - Photonic Crystal Fiber (PCF)*
  - Microstructured Fibers*
  - Non-Circular Fibers
- Programmable Handset Included
- Holding Blocks and Inserts are Compatible with Other Vytran™ Systems:
  - FPS300 Cleaning and Stripping Station
  - LFS4100 Splicer
  - GPX3400 and GPX3600 Glass Fiber Processing Stations



Click to Enlarge
A close-up of the cleave assembly on the LDC400A shown with a large-diameter fiber mounted in the fiber holding blocks. The clamping screw on the top of each holding block can be tightened to provide extra clamping force for gripping fibers with outer diameters ≥500 µm. Magnets in each holding block provide sufficient force for clamping smaller fiber diameters.

Build Your System

- Large-Diameter Fiber Cleaver for Fibers with Claddings from Ø80 µm to Ø1.25 mm
- Choose Top and Bottom Inserts (Two Top Inserts and Two Bottom Inserts are Required; See *Fiber Holder Insert* Tab for More Information)

These Vytran™ Fiber Cleavers precisely cleave fibers with claddings from 80 µm to 1.25 mm in diameter. The LDC400 is designed to produce flat cleaves perpendicular to the length of the fiber, while the LDC400A has a rotation stage module for creating angled cleaves up to 15°.* Each cleaver is equipped with a flat-tipped micrometer backstop, which can help improve end-face quality when performing low-tension cleaves.

The cleavers use the "tension-and-scribe" cleaving process, where tension is applied along the length of the fiber followed by an automatic scribing process utilizing a diamond cleave blade. After the blade scribes the fiber, tension is maintained, causing the scribe to propagate across the fiber width and complete the cleave. LDC400A accomplishes angled cleaves by using the rotation stage to apply torsion to the fiber prior to scribing. The cleave plane will be perpendicular to the maximum resultant stress created by the combined tension and torsion applied to the fiber. The cleavers also have settings to carry out an automated "sub-critical" scribe process designed to improve the cleave quality in specialty fibers, such as photonic crystal fiber (PFC), microstructured fibers, capillary tubes, or highly stressed fibers (multimode or polarization maintaining). See the *Cleaving Guide* tab for details.

Accessories
The LDC400 and LDC400A are designed to accept Fiber Holder Inserts that can clamp a variety of outer diameters. Our selection of top and bottom inserts are available separately below, listed with the maximum fiber sizes accepted by each insert. The *Fiber Holder Inserts* tab has a selection guide to aid in choosing which pairs of fiber holder inserts are required based on the diameter of the fiber to be cleaved. Two top and two bottom inserts are required to operate the fiber cleaver.

Many of the fiber holder inserts used with the FPS300 Stripping and Cleaning Station, LFS4100 Fiber Splicer, and GPX3400 and GPX3600 Glass Fiber Processing Stations are also compatible with the LDC400 and LDC400A cleavers. Visit these webpages to learn more about alternative fiber holder options when using these large-diameter fiber cleavers with other Vytran products.

Each cleaver includes a diamond blade for scribing the fiber. When used with proper cleave parameters, a single location on the blade can provide up to 5,000 cleaves (dependent on the cladding properties of the fiber being cleaved). The cleaver is designed so that the cleave blade can be repositioned approximately nine times before replacement (assuming proper cleave parameters and usage that does not cause unexpected damage to the blade). We only recommend using these cleavers with fibers that have a glass cladding; other materials, such as plastic, will rapidly degrade or damage the blade. Replacement blades are available separately below.

*It may not be possible to create clean angled cleaves in specialty fibers with large "air-fill" fractions due to the material properties of the fiber.

Compatible Vytran™ Fiber Processing Systems					
Fiber Preparation Station (Strip and Clean)	Large-Diameter Fiber Cleavers	Large-Diameter Fiber Splicer	Automated Glass Processing Systems with Integrated Cleaver (Cleave, Splice, and Taper)	Automated Glass Processing Systems (Splice and Taper)	Recoaters, Proof Testers, and Recoaters with Proof Testers

S P E C S

Specifications		
Item #	**LDC400**	**LDC400A**
Cleave Type	Flat Cleave	Flat Cleave or Angled[a] Cleave up to 15°
Accepted Fiber Sizes	Cladding: Ø80 µm to Ø1.25 mm Buffer: Ø80 µm to Ø3.198 mm	
Accepted Fiber Types	SM, PM, MM, Specialty Fibers Including Photonic Crystal Fiber (PCF) and Non-Circular Fiber, Capillary Tubes	
Cleave Method	Tension and Scribe	
Cleave Tolerance	±0.5°	±0.5° (Flat) ±1.0° (Angled)
Rotation Stage	N/A	0.1° Resolution, Stepper Motor Controlled
Loading	Linear Tension, Stepper Motor Controlled	
Tension	63.7 N (14.3 lbs) Max, Programmable[b]	
Scribe	Diamond Blade, Stepper Motor Controlled	
Fiber Holding Blocks	Internal Vacuum Pump for Easier Loading, Up to 9 inHg (4.4 psi) of Pressure	
V-Groove Inserts	Available Separately Below	
Power	12.5 VDC, 5 A (Provided by External Power Supply)	
External Power Supply	100 - 120 / 200 - 240 VAC, 4.5 / 2.2 A, 47 - 63 Hz	
Dimensions (L x W x H) without Holding Blocks or Rotation Stage	10.14" x 5.00" x 5.00" (258 mm x 127 mm x 127 mm)	
Dimensions (L x W x H)	10.14 " x 5.00" x 6.88" (258 mm x 127 mm x 175 mm)	10.14" x 5.00" x 6.96" (258 mm x 127 mm x 177 mm)
Weight	10.0 lbs (4.5 kg)	

- It may not be possible to create clean angled cleaves in specialty fibers with large "air-fill" fractions due to the material properties of the fiber.
- These cleavers are calibrated using standard weights that are hung off of a pulley, so the tension settings are programmed into the handset in grams. This maximum tension corresponds to 6.5 kg.

Programmable Cleave Parameters

These large-diameter fiber cleavers are designed to provide easy operation when performing simple cleaves but still support customized processing for more complicated cleaves involving specialty fibers. A complete list of modifiable parameters is listed below. The majority of users will only need to enter the Fiber Diameter (cladding), Cleave Tension, and Pre-Cleave Advance while leaving the rest of the parameters set to their default values. To further simplify the process, an autoset function in the handset will estimate an appropriate Cleave Tension and Pre-Cleave Advance based on the fiber diameter, although these values can be adjusted by the user if necessary.

Programmable Handset Parameter Limits			
Parameter	**Default**	**Minimum**	**Maximum**
Fiber Diameter	Fiber Size Dependent	10 µm	1500 µm
Cleave Tension[a]	Fiber Size Dependent	1 g	6500 g
Pre-Cleave Advance	Fiber Size Dependent	200 Steps	400 Steps
Set FHB Offset	0 mm	0 mm	47 mm
Tension Velocity	60 Steps/s	4 Steps/s	200 Steps/s
Rotation Angle (LDC400A Only)	0°	0°	180°
Cleave Peck Cycles	60	10	250
Cleave Forward Steps	81	40	400
Cleave Back Steps	80	39	399
Scribe Delay	250 ms	1 ms	5000 ms
Set Blade Offset	Unit Specific Value	100 Steps	2500 Steps

Sub-Critical Process Parameters[b]			
Re-Tension Level[c]	10 g	1 g	100 g
Post-Scribe Pause	1.0 s	0.1 s	30.0 s
Re-Tension Pause	1.0 s	0.1 s	30.0 s
Re-Tension Limit	20% of Cleave Tension	1% of Cleave Tension	50% of Cleave Tension

- These cleavers are calibrated using standard weights that are hung off of a pulley, so the tension settings are programmed into the handset in grams. This corresponds to a range of tensions from 9.8 mN (0.0022 lbs) to 63.7 N (14.3 lbs).
- These parameters only appear in the controller when the subcritical process is enabled.
- These cleavers are calibrated using standard weights that are hung off of a pulley, so the tension settings are programmed into the handset in grams. This corresponds to a range of tensions from 9.8 mN (0.0022 lbs) to 0.98 N (0.22 lbs).

Programmable Handset Cleave Parameter Definitions

The definition of each of the parameters that can be entered into the programmable handset are described below.

Fiber Diameter: The diameter of the fiber cladding. This is also the fiber cleave parameter file name.

Cleave Tension: The load applied to the fiber prior to initiating the scribe process. These cleavers are calibrated using standard weights that are hung off of a pulley, so the tension settings are programmed into the handset in grams. Possible settings correspond to a range of tensions from 9.8 mN (0.0022 lbs) to 63.7 N (14.3 lbs).

Pre-Cleave Advance: Before cleaving, the cleave blade must move closer to the fiber. The location of the blade just prior to cleaving is set using this parameter. One step corresponds to 0.00006" (1.5 µm).

Set FHB Offset: This stands for "Set Fiber Holding Block Offset". It is the distance that the left fiber holding block will be shifted to the left from the "home" position prior to loading the fiber. This allows the user to adjust the distance between the edge of the holding block and the cleave point.

Tension Velocity: The speed at which tension is applied to the fiber prior to cleaving. One step corresponds to 0.00003125" (0.8 µm).

Cleave Peck Cycles: To properly cleave the fiber, the cleave blade will ideally make one single, quick contact with the fiber. In order to achieve this, the blade will begin to oscillate forward and backwards after the pre-cleave advance distance has been traveled. This parameter sets the total number of oscillations that will occur during the cleave process.

Cleave Forward Steps: This parameter controls how far the blade moves towards the fiber during the "forward" portion of the cleave peck cycle. One step corresponds to 0.00006" (1.5 µm).

Cleave Back Steps: This parameter controls how far the blade moves away from the fiber during the "backward" portion of the cleave peck cycle. One step corresponds to 0.00006" (1.5 µm).

Scribe Delay: This is the delay in milliseconds between each cleave peck cycle. It provides time for the scribe to propagate across the fiber, completing the cleave, before the blade moves forward again. This helps prevent the blade from contacting the fiber more than once.

Set Blade Offset: Adjusts the position that the blade returns to after homing. This allows the starting point for the pre-cleave advance and subsequent cleave peck cycles to be globally adjusted. One step corresponds to 0.00006" (1.5 µm).

Special Sub-Critical Process Parameters

During the Sub-Critical Process, additional tension is applied to the fiber after the scribe occurs.

Post-Scribe Pause: The time, in seconds, between the last oscillation of the cleave blade and the first increase in tension applied to the fiber.

Re-Tension Pause: The time between subsequent increases in the tension applied to the fiber (all increases in tension after the first one, which occurs after the Post-Scribe Pause).

Re-Tension Level: The tension is increased incrementally after the scribe. This is the amount by which the tension is increased after the Post-Scribe Pause and each Re-Tension Pause. These cleavers are calibrated using standards weights that are hung off of a pulley, so the tension settings are programmed into the handset in grams. Possible settings correspond to a range of tensions from 9.8 mN (0.0022 lbs) to 0.98 N (0.22 lbs).

Re-Tension Limit: The maximum amount of additional tension that will be applied to the fiber as a percentage of the original tension.

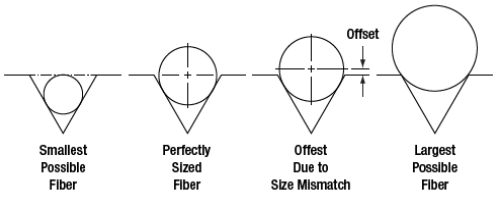
FIBER HOLDER INSERTS

Fiber Holder Insert Selection Guide

Fiber Holder Inserts, which are designed to hold various sized fibers within the cleaver, must be purchased separately. The bottom inserts have V-grooves to hold the fiber, while the top inserts each feature a recessed, flat surface that clamps the fiber against the V-groove in the bottom insert. Each top and bottom insert is sold individually, as the fiber diameter clamped by the left and right holding blocks may not be the same. Two top inserts and two bottom inserts are required to operate the cleaver.

The table below indicates the maximum and minimum diameters that can be accommodated by different combinations of top and bottom inserts. It also indicates how far offset the fiber will be for recommended combinations of top and bottom inserts. Note that the fiber outer diameter may be the fiber cladding, jacket, or buffer. If one side of the fiber is being discarded, it is preferable to clamp onto the cladding of this section except in special cases (such as non-circular fiber) where the coating or buffer may be preferable. Sections of fiber that are not being discarded should always be clamped on the coating or buffer in order to avoid damaging the glass. This may require different sets of fiber holder inserts to be used in the left and right holding blocks. In this case, it is important to minimize the difference in the offsets introduced by the left and right sets of inserts when attempting to produce perpendicular, flat cleaves.

Fiber Holder Insert Selection Chart



Each V-groove can accommodate a range of fiber sizes.

1. **First, select the bottom insert that matches your fiber size most closely.**
   Example: For an Ø800 µm fiber, the VHD750 insert is the closest match, since it is only 50 µm smaller.
2. **On the chart below, look to the right of your chosen bottom insert. Select a compatible top insert based on the fiber diameter size range shown in each cell.**
   Example: For the Ø800 µm example fiber from step 1, the green cell is in the 750 µm groove column for the VHA05 top insert which has two grooves. The numbers listed in the green cell indicate that this combination of inserts is good for fibers from 728 to 963 µm in diameter. Our Ø800 µm fiber is within this range, so this is a good choice. There are several other options as well that will accommodate an Ø800 µm fiber as well, but the green shading in the chart indicates that the 750 µm groove in the VHA05 provides the best fit.

Legend	
	Best Fit
	Second Best Fit: Try these options if the best fit does not incorporate your fiber sizes.
	Third Best Fit: Try these options if the other two categories do not incorporate your fiber sizes.

3. **The second line of numbers in each cell shows the range of offsets that can be expected for any given combination of top and bottom inserts. When selecting inserts for the right and left fiber holding blocks, try to minimize the offsets between the pairs of inserts on each side.**
   Example: If we choose a VHD750 bottom insert and the Ø750 µm groove in the VHA05 top insert, we can use fiber as small as 728 µm, in which case the center of the fiber would sit 23 µm below the surface of the bottom insert. We could also clamp a fiber as large as 963 µm, in which case the center of the fiber would sit 213 µm above the surface of the bottom insert. We could interpolate to find the offset experienced by our hypothetical 800 µm fiber, but it turns out that in a 60° V-groove, the offset is equal to the diameter difference. So in our example, that means that the center of our fiber is going to sit 50 µm above the bottom insert surface, since it is 50 µm larger than the fiber that the bottom insert was designed for (800 - 750 = 50).
4. **Holding blocks designed for fibers less than Ø1000 µm have vacuum holes, designed to aid in aligning small fiber within the groove, while bottom inserts for fibers of Ø1000 µm or larger do not have these holes.** The LDC400 and LDC400A each have a vacuum pump that provides a small holding force via these holes, keeping small fibers in place as the clamps are lowered. Inserts with vacuum holes are indicated by a superscript "b" in the table below.

Top Insert Item #		**VHA00[a]**		**VHA05[a]**		**VHA10[a]**		**VHA15[a]**		**VHA20[a]**		**VHA25**	**VHA30**
Accepted Diameter (Nominal)		**≤320 µm**	**400 µm**	**500 µm**	**750 µm**	**1000 µm**	**1250 µm**	**1500 µm**	**1750 µm**	**2000 µm**	**2250 µm**	**2500 µm**	**3000 µm**
Bottom Insert Item #	**Accepted Diameter (Nominal)**	**Min / Max Accepted Fiber Diameter (µm) Min / Max Fiber Offset (µm)**											
VHD080[b]	**80 µm**	57 / 100 -23 / 21	-	-	-	-	-	-	-	-	-	-	-
VHD125[b]	**125 µm**	88 / 161 -37 / 36	-	-	-	-	-	-	-	-	-	-	-
VHD160[b] or VHF160b,c	**160 µm**	112 / 208 -49 / 48	-	-	-	-	-	-	-	-	-	-	-
VHD250[b] or VHF250[b,c]	**250 µm**	177 / 320 -73 / 69	275 / 323 25 / 74	-	-	-	-	-	-	-	-	-	-

Top Insert Item #		VHA00[a]		VHA05[a]		VHA10[a]		VHA15[a]		VHA20[a]		VHA25	VHA30
Accepted Diameter (Nominal)		≤320 µm	400 µm	500 µm	750 µm	1000 µm	1250 µm	1500 µm	1750 µm	2000 µm	2250 µm	2500 µm	3000 µm
VHD400[b] or VHF400[b,c]	400 µm	279 / 519 -122 / 119	377 / 517 -23 / 117	410 / 519 -9 / 119	-	-	-	-	-	-	-	-	-
VHD500[b] or VHF500[b,c]	500 µm	346 / 592 -153 / 93	447 / 647 -53 / 147	476 / 711 -24 / 211	560 / 795 61 / 296	-	-	-	-	-	-	-	-
VHD750[b] or VHF750[b,c]	750 µm	516 / 759 -234 / 9	617 / 970 -132 / 221	643 / 878 -107 / 128	728 / 963 -23 / 213	812 / 1047 62 / 297	-	-	-	-	-	-	-
VHE10[a]	1000 µm	-	-	773 / 1008 -172 / 63	858 / 1093 -88 / 147	943 / 1178 -3 / 232	1036 / 1271 90 / 325	-	-	-	-	-	-
	1250 µm	-	-	-	1034 / 1269 -176 / 59	1119 / 1354 -91 / 144	1212 / 1447 2 / 237	1288 / 1523 78 / 313	-	-	-	-	-
VHE15[a]	1500 µm	-	-	-	-	1280 / 1515 -172 / 63	1373 / 1608 -79 / 156	1449 / 1684 -2 / 233	1534 / 1769 82 / 314	-	-	-	-
	1750 µm	-	-	-	-	-	1534 / 1770 -159 / 76	1611 / 1846 -83 / 152	1695 / 1930 2 / 237	1772 / 2007 78 / 313	-	-	-
VHE20[a]	2000 µm	-	-	-	-	-	-	1787 / 2022 -171 / 64	1871 / 2106 -86 / 149	1947 / 2183 -10 / 225	2032 / 2267 74 / 309	-	-
	2250 µm	-	-	-	-	-	-	-	2033 / 2268 -167 / 68	2109 / 2344 -91 / 144	2193 / 2429 -6 / 229	2278 / 2513 78 / 313	-
VHE25	2500 µm	-	-	-	-	-	-	-	-	2270 / 2505 -172 / 64	2355 / 2590 -87 / 148	2439 / 2675 -2 / 233	2609 / 2844 167 / 402
VHE30	3000 µm	-	-	-	-	-	-	-	-	-	2692 / 2944 -256 / -4	2777 / 3029 -171 / 81	2946 / 3918 -2 / 250

- These inserts have two grooves, one on each side, that each accommodate a different range of fiber sizes, except for the VHA00, which has a flat surface on one side that can be used to clamp the smallest fiber sizes.
- These bottom inserts have vacuum holes to aid in aligning small fibers when used with the large-diameter fiber cleavers.
- These are transfer inserts. When used with the VHT1 transfer clamp, they allow the fiber to be transferred between compatible stripping, cleaning, cleaving, splicing, and tapering stations without losing registration of the fiber tip location relative to the edges of the fiber holding block.

CLEAVING GUIDE

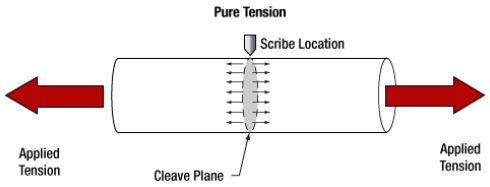
Tension-and-Scribe Cleave Process

The LDC400 cleavers use the "tension-and-scribe" cleaving process, where tension is applied along the length of the fiber followed by an automatic scribing process utilizing a diamond blade. After the blade scribes the fiber, tension is maintained, causing the scribe to propagate across the fiber width and complete the cleave. Angled cleaves are accomplished in the LDC400A by using the rotation stage to apply torsion to the fiber, starting prior to commencing the "tension-and-scribe" process. The cleave plane will then be perpendicular to the maximum resultant stress created by the combined tension and torsion applied to the fiber.

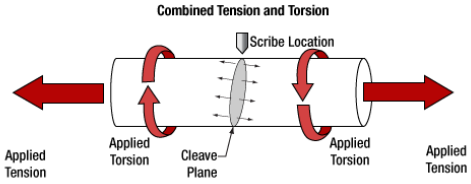
Sub-Critical Process for Cleaving Specialty Fibers

Certain specialty fibers, such as photonic crystal fiber (PCF), microstructured fibers, capillary tubes, or highly stressed fibers (multimode or polarization maintaining) may require special parameters in order to create clean cleaves at the desired angle. These Vytran™ fiber cleavers can be programmed with a "sub-critical" cleave process in order to produce high-quality cleaves for these fiber types.

Tension-and-Scribe Cleave Process



Click to Enlarge
An illustration of the tension-and-scribe method as used by the LDC400 and LDC400A to produce a flat cleave. Tension is applied along the optical axis of the fiber prior to cleaving. A diamond blade then scribes the fiber, and the tension causes the scribe to propagate across the fiber in a plane that is orthogonal to the direction of the tension.



Click to Enlarge
An illustration of the tension-and-scribe method as used by the LDC400A to produce an angled cleave. Tension and torsion are applied simultaneously to the fiber prior to cleaving. When the blade scribes the fiber, the scribe propagates across the fiber orthogonally to the direction of the maximum resultant stress produced by the combined tension and torsion, producing an angled cleave.

For these cleaves, the initial tension applied to the fiber is lower than what would be required for the standard "tension-and-scribe" process. The included micrometer backstop prevents the fiber from bending when it is scribed at this lower tension. After the scribe, the tension is slowly, incrementally increased, which serves to propagate the scribe across the fiber and complete the cleave. Parameters for this process can be adjusted using the handset, including the starting and ending tension and how fast the tension is increased after the initial scribe.

Cleaving Guide

The following information is intended to provide a starting point when selecting the best process to use for cleaving different types of fiber. To achieve the best possible cleave results, further experimentation is typically required to fine-tune the cleave parameters for each specific fiber type.

Standard Process: The tension-and-scribe method where a constant tension is applied to the fiber, the fiber is scribed, and the tension causes the scribe to propagate across the fiber to produce the cleave.

Sub-Critical Process: This process starts with a lower tension applied to the fiber than required by the standard cleaving process. After the fiber is scribed, the tension is slowly increased until the scribe propagates across the fiber and the cleave is complete. This can improve the cleave quality in highly stressed or specialty fibers.

Micrometer Backstop: The tip of the micrometer is positioned so that it just touches the fiber, providing a surface that prevents the fiber from deforming when contacted by the cleave blade during scribing. It is particularly useful when cleaving large-diameter fibers or when using the lower-tension sub-critical process.

Fiber Type	Cleave Type	Standard Process	Sub-Critical Process	Micrometer Backstop
Fiber with Cladding <Ø800 µm	Flat or Angled[a]	✓	-	-
Fiber with Cladding ≥Ø800 µm	Flat or Angled[a]	✓	May Be Necessary	Use if the Cleave Blade is Pushing the Fiber Forwards without Cleaving
Multimode Fiber	Flat	✓	-	-
	Angled[a]	-	✓	Use if Fiber Cladding is >Ø400 µm
Thick-Walled Capillary Tubing (Wall Thickness at Least 10% of Diameter)	Flat or Angled[a]	-	-	✓

Fiber Type	Cleave Type	Standard Process	Sub-Critical Process	Micrometer Backstop
Thin-Walled Capillary Tubing (Wall Thickness <10% of Diameter)	Flat or Angled[a]	-	✓	✓
PM Fiber	Flat	Use if Fiber Cladding is ≤Ø400 µm	Use if Fiber Cladding is >Ø400 µm	✓
	Angled[a]	-	✓	✓
PCF	Flat or Angled[a]	-	✓	✓

- Only the LDC400A can be used to produce angled cleaves.

PRODUCT DEMOS

vytran a division of THORLABS

Product Demonstrations

Thorlabs has demonstration facilitates for the Vytran™ fiber glass processing systems offered on this page within our Morganville, New Jersey; Exeter, Devonshire; and Shanghai, China offices. We invite you to schedule a visit to see these products in operation and to discuss the various options with a fiber processing specialist. Please schedule a demonstration at one of our locations below by contacting technical support. We welcome the opportunity for personal interaction during your visit!

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Fiber Cleaver for Ø80 µm to Ø1.25 mm Cladding Fibers

- Cleave Fibers with Claddings from Ø80 µm to Ø1.25 mm
  - LDC400: Flat Cleaves Only
  - LDC400A: Flat Cleaves or Angled Cleaves up to 15°
- Accepts SM, MM, PM, and Specialty Fibers
- Includes Micrometer Backstop to Support Low-Tension Cleave Processes
- Diamond Cleave Blade
- Two Versions Available
  - LDC400: Flat Cleaves Only
  - LDC400A: Flat and Angled Cleaves
- Fiber Holder Inserts Must be Purchased Separately (Available Below)

Components

Included

- LDC400 or LDC400A
- Handset Controller
- 12 V Power Supply
- Location-Specific AC Power Cord
- DC Power Cord
- Tool Kit with 0.035", 0.050", and 3/32" Allen Keys

Must be Purchased Separately

- Fiber Holder Top Inserts (Two Required)
- Fiber Holder Bottom Inserts (Two Required)

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LDC400 Fiber Cleaver for Flat Cleaves

The Vytran™ LDC400 and LDC400A Fiber Cleavers produce high-quality cleaves in fibers with claddings from Ø80 µm to Ø1.25 mm in order to support precision splicing applications. The LDC400 produces flat cleaves (i.e., a cleave plane perpendicular to the length of the fiber), while the LDC400A can produce both flat and angled cleaves. Each cleaver features a diamond cleave blade, a micrometer backstop that enables low-tension cleaves in specialty fibers, and a ruler block and translating fiber holding blocks to align the point to be cleaved. The LDC400A also includes a rotary stage to apply the torsion needed for angled cleaves.

The left fiber holding block is connected to the same motorized stage as is used in our linear proof testers and includes a load cell that allows the system to internally monitor the tension applied to the fiber during the cleave process. The position of this holding block can be adjusted prior to cleaving by entering the desired position into the handset controller in millimeters.

The handset included with each cleaver allows the parameters of the cleave process to be precisely controlled. Adjustable settings include the fiber tension, rotation angle, velocity at which the tension and torsion are applied to the fiber, how quickly the scribe approaches the fiber, and fiber diameter. A cleave angle calculator, included in the LDC400A handset, provides an estimate of cleave parameters that can be refined by the user. The handset can store up to 50 cleave parameter files and is shipped preloaded with ten files for common cleave parameters.

Once the desired cleave parameters are set and loaded into the cleaver, the handset can be removed and the cleaving process initiated by pressing the blue button on the top of the unit. For manufacturing environments with multiple cleaving stations, this feature streamlines the production process by allowing the same cleave parameters to be easily loaded into multiple LDC400 cleavers.

These cleavers use fiber holding blocks that are compatible with the FPS300 Stripping and Cleaning Station, LFS4100 Fiber Splicer, and GPX3000 Glass Fiber Processing Stations, allowing fiber to be moved easily between systems. Fiber Holder Inserts are available below in a variety of sizes and must be purchased separately. A selection guide is provide on the *Fiber Holder Inserts* tab to aid in determining which inserts are appropriate for the fiber to be cleaved.

Each unit is shipped with a power supply and location-specific power cord.

Note: Due to the unit's design, it is not possible to upgrade an LDC400 to perform angled cleaves.

Part Number	Description	Price	Availability
LDC400	**Large-Diameter Fiber Cleaver, Ø80 µm to Ø1.25 mm Cladding, Flat Cleaves**	**$10,550.00**	**Today**
LDC400A	**Large-Diameter Fiber Cleaver, Ø80 µm to Ø1.25 mm Cladding, Flat and Angled Cleaves**	**$12,550.00**	**Today**

Fiber Holder Top Inserts - Two Required

- Two are Required to use the Large-Diameter Fiber Cleavers
- Flat, Recessed Surface Clamps the Fiber Against the V-Groove in the Bottom Insert (Sold Below)
- Clamp Fiber Outer Diameters from 57 µm to 3.198 mm When Used with Bottom Inserts
- Compatible with Other Vytran™ Systems
  - FPS300 Fiber Preparation Station
  - LFS4100 Splicer
  - GPX3400 and GPX3600 Glass Fiber Processing Stations
- Interchangeable by the User

Fiber Holder Top Inserts[a]		
Item #	**Side 1 Min/Max Accepted Diameter**	**Side 2 Min/Max Accepted Diameter**
VHA00	57 µm / 759 µm[b]	275 µm / 970 µm
VHA05	410 µm / 1008 µm	560 µm / 1269 µm
VHA10	812 µm / 1515 µm	1036 µm / 1770 µm
VHA15	1288 µm / 2022 µm	1534 µm / 2268 µm
VHA20	1772 µm / 2505 µm	2032 µm / 2944 µm
VHA25	2278 µm / 3029 µm	N/A
VHA30	2609 µm / 3198 µm	N/A

- Please see the *Fiber Holder Insert* tab for information on how to match top and bottom inserts to achieve the best cleave quality.
- This side of the VHA00 is flat to provide additional clamping force for fibers with very small diameters.

The large-diameter fiber cleavers require a pair of Top and Bottom Fiber Holder Inserts to be placed in each of the fiber holding blocks in order to clamp the fiber during the cleaving process. Each top insert consists of a bar that has a recessed area on one or both sides, designed to clamp the fiber against the V-groove in a bottom insert. The inserts sit in the top section of the fiber holding blocks and are available in a variety of groove sizes. Top inserts are sold individually, and two are required to use these cleavers.

The top and bottom inserts (available below) can be paired in different combinations, outlined on the *Fiber Holder Inserts* tab above, to accommodate fiber with outer diameters from 57 µm to 3.198 mm.

While the cleavers can only cleave fibers with cladding diameters from 80 µm up to 1.25 mm, the inserts can accommodate a wider range of outer diameters, as there are cases where the fiber should be clamped on the coating instead of the cladding. During a typical cleave, it is often desirable to clamp the cladding on the side to be discarded and the coating on the side of the fiber that will be retained. Alternatively, the fiber may be center stripped and the coating clamped on both sides (preferable in some cases, such as creating a firm clamp on non-circular fiber). Therefore, multiple combinations of top and bottom inserts may be required to accommodate all of the diameters that need to be clamped. The *Fiber Holder Insert* tab above includes information and a table to aid in selecting the correct combinations of top and bottom inserts to accommodate fiber outer diameters between 57 µm and 3.198 mm.

Part Number	Description	Price	Availability
VHA00	**Dual-Sided Fiber Holder Top Insert, Ø57 µm - Ø970 µm**	**$155.00**	**Today**
VHA05	**Dual-Sided Fiber Holder Top Insert, Ø410 µm - Ø1269 µm**	**$155.00**	**Today**
VHA10	**Dual-Sided Fiber Holder Top Insert, Ø812 µm - Ø1770 µm**	**$155.00**	**Today**
VHA15	**Dual-Sided Fiber Holder Top Insert, Ø1288 µm - Ø2268 µm**	**$155.00**	**Today**
VHA20	**Dual-Sided Fiber Holder Top Insert, Ø1772 µm - Ø2944 µm**	**$155.00**	**Today**
VHA25	**Fiber Holder Top Insert, Ø2278 µm - Ø3029 µm**	**$155.00**	**Today**
VHA30	**Fiber Holder Top Insert, Ø2609 µm - Ø3198 µm**	**$155.00**	**Today**

Fiber Holder Bottom Inserts - Two Required

- Two are Required to Use the LDC400 or LDC400A
- V-Groove Fiber Holder Insert Bottom Inserts
- Clamp Fiber Outer Diameters from 57 µm to 3.198 mm when Used with Top Inserts (Available Above)
- VHD and VHF Series of Inserts Have Holes for Vacuum Suction to Aid in Positioning Small Fibers when Used in the LDC400 or LDC400A (See the Table to the Right)
- Use a Transfer Insert with the VHT1 Transfer Clamp to Aid in Transferring a Fiber with a Coating ≤Ø1.047 mm between Compatible Vytran™ Systems
  - FPS300 Fiber Preparation Station
  - LFS4100 Splicer
  - GPX3400 and GPX3600 Glass Fiber Processing Stations
- Interchangeable by the User

Fiber Holder Bottom Inserts[a]				
Item #	**Transfer Insert**	**Side 1 Min/Max Accepted Diameter**	**Side 2 Min/Max Accepted Diameter**	**Vacuum Holes**
VHD080	No	57 µm / 100 µm	N/A	Yes
VHD125	No	88 µm / 161 µm	N/A	Yes
VHD160	No	112 µm / 208 µm	N/A	Yes
VHF160	Yes[b]			
VHD250	No	177 µm / 320 µm	N/A	Yes
VHF250	Yes[b]			
VHD400	No	279 µm / 519 µm	N/A	Yes
VHF400	Yes[b]			
VHD500	No	346 µm / 795 µm	N/A	Yes
VHF500	Yes[b]			
VHD750	No	516 µm / 1047 µm	N/A	Yes
VHF750	Yes[b]			
VHE10	No	773 µm / 1271 µm	1034 µm / 1523 µm	No
VHE15	No	1280 µm / 1769 µm	1534 µm / 2007 µm	No
VHE20	No	1787 µm / 2267 µm	2033 µm / 2513 µm	No
VHE25	No	2270 µm / 2844 µm	N/A	No
VHE30	No	2692 µm / 3198 µm	N/A	No

- Please see the *Fiber Holder Insert* tab for information on how to match top and bottom inserts to achieve the best cleave quality.
- If using these cleavers with other compatible Vytran™ systems, a transfer insert may be used in place of the standard bottom insert. Combined with the VHT1 transfer clamp, the transfer inserts allow the fiber to be moved between compatible Vytran™ stations while maintaining coarse alignment.

The large-diameter fiber cleavers require a pair of Top and Bottom Fiber Holder Inserts to be placed in each of the fiber holding blocks in order to clamp the fiber during the cleaving process. Each bottom insert has a V-Groove on one or both sides that can accommodate a range of diameters (as indicated in the table to the right).

Three types of bottom inserts are available for these large-diameter fiber cleavers. Standard bottom inserts for fiber with an outer diameter <Ø1.047 mm have vacuum holes to help position the fiber in the groove when loading the cleaver. For certain fiber diameters, we also offer transfer inserts (Item #s beginning with VHF) designed to work with the VHT1 transfer clamps (available below) that aid in moving the fiber between compatible Vytran™ stations while maintaining coarse alignment. The VHE series of fiber holder bottom inserts have a V-Groove on one (VHE25 and VHE30) or both sides (VHE10, VHE15, and VHE20) but do not include vacuum holes. The VHF transfer inserts and VHE bottom inserts can both be installed in other, compatible Vytran™ stations, although the VHE bottom inserts cannot be used with the VHT1 transfer clamp.

Bottom inserts are sold individually, and two are required to use the large-diameter cleavers. If using the fiber cleaver as a stand-alone device, the VHD series or VHE series inserts will be sufficient. If using the cleavers with other compatible Vytran™ systems, the bottom insert in the left fiber holding block can be replaced with a transfer insert and VHT1 transfer clamp (available below) for certain fiber sizes, as indicated in the table to the right. Typically, these transfer inserts would only be used in the left fiber holder block, as the right fiber holding block usually clamps the side of the fiber that will be discarded. The right fiber holding block of the LDC400 can accept transfer inserts, if desired, while the right fiber holding block of the LDC400A is incompatible with the transfer inserts, due to the presence of the rotation stage.

The top (available above) and bottom fiber holder inserts can be paired in different combinations, outlined on the *Fiber Holder Inserts* tab above, to accommodate fiber with outer diameters from 57 µm to 3.918 mm. While the cleavers can only cleave fibers with cladding diameters from 80 µm up to 1.25 mm, the inserts can accommodate a wider range of outer diameters, as there are cases where the fiber should be clamped on the coating instead of the cladding. During a typical cleave, it is often desirable to clamp the cladding on the side to be discarded and the coating on the side of the fiber that will be retained. Alternatively, the fiber may be center stripped and the coating clamped on both sides (preferable in some cases, such as creating a firm clamp on non-circular fiber). Therefore, multiple combinations of top and bottom inserts may be required. The *Fiber Holder Insert* tab above includes information and a table to aid in selecting the correct combinations of top and bottom inserts to accommodate fiber outer diameters from 57 µm to 3.198 mm.

Part Number	Description	Price	Availability
VHD080	**Fiber Holder Bottom Insert, Ø57 µm - Ø100 µm**	**$195.00**	**Today**
VHD125	**Fiber Holder Bottom Insert, Ø88 µm - Ø161 µm**	**$195.00**	**Today**
VHD160	**Fiber Holder Bottom Insert, Ø112 µm - Ø208 µm**	**$195.00**	**Today**
VHF160	**Fiber Holder Transfer Bottom Insert, Ø112 µm - Ø208 µm**	**$290.00**	**Today**
VHD250	**Fiber Holder Bottom Insert, Ø177 µm - Ø320 µm**	**$195.00**	**Today**
VHF250	**Fiber Holder Transfer Bottom Insert, Ø177 µm - Ø320 µm**	**$290.00**	**Today**
VHD400	**Fiber Holder Bottom Insert, Ø279 µm - Ø519 µm**	**$195.00**	**Today**
VHF400	**Fiber Holder Transfer Bottom Insert, Ø279 µm - Ø519 µm**	**$290.00**	**Today**

VHD500	**Fiber Holder Bottom Insert, Ø346 µm - Ø795 µm**	**$195.00**	**Today**
VHF500	**Fiber Holder Transfer Bottom Insert, Ø346 µm - Ø795 µm**	**$290.00**	**Today**
VHD750	**Fiber Holder Bottom Insert, Ø516 µm - Ø1047 µm**	**$195.00**	**Today**
VHF750	**Fiber Holder Transfer Bottom Insert, Ø516 µm - Ø1047 µm**	**$290.00**	**Today**
VHE10	**Dual-Sided Fiber Holder Bottom Insert, Ø773 µm Ø1523 µm**	**$195.00**	**Today**
VHE15	**Dual-Sided Fiber Holder Bottom Insert, Ø1280 µm - Ø2007 µm**	**$195.00**	**Today**
VHE20	**Dual-Sided Fiber Holder Bottom Insert, Ø1787 µm - Ø2513 µm**	**$195.00**	**Today**
VHE25	**Fiber Holder Bottom Insert, Ø2270 µm - Ø2844 µm**	**$195.00**	**Today**
VHE30	**Fiber Holder Bottom Insert, Ø2692 µm - Ø3198 µm**	**$195.00**	**Today**

Fiber Transfer Clamp and Graphite V-Grooves - Required for VHF Transfer Bottom Inserts

- Transfer Clamp and Graphite Tips for Fiber Holder Transfer Bottom Inserts
- Transfer Clamps Required to Transfer Fibers in VHF Inserts Between Compatible Vytran™ Systems
  - FPS300 Cleaning and Stripping Station
  - LFS4100 Splicer
  - GPX3400 and GPX3600 Glass Fiber Processing Stations
- Graphite V-Grooves for Supporting Fibers ≤Ø500 µm During Splicing or Tapering
- V-Grooves Accept Diameters from 80 µm to 550 µm

Graphite V-Grooves[a]	
Item #	**Accepted Diameter (Min / Max)**
VHG125L	80 µm / 125 µm
VHG200	150 µm / 200 µm
VHG250	200 µm / 250 µm
VHG300	250 µm / 300 µm
VHG350	300 µm / 350 µm
VHG400	350 µm / 400 µm
VHG450	400 µm / 450 µm
VHG500	450 µm / 500 µm
VHG550	500 µm / 550 µm

- Graphite V-grooves are not required for fibers with diameters larger than 550 µm.

These Transfer Clamps and V-Grooves are used with the VHF Transfer Bottom Inserts sold directly above to move a single fiber between various Vytran™ systems with minimal loss of alignment. For example, a fiber can be placed in a transfer insert and cleaved using the LDC400. Then, the entire transfer insert and fiber can be moved to a splicer or glass processor for splicing.

The VHT1 clamp secures transfer inserts with a magnetic lid that prevents axial movement of the fiber and can be used to hold the insert during transport without touching the fiber itself. For fibers with diameters ≤550 µm, a graphite V-groove is available to support the fiber when splicing (please see the size table to the right for more information). The graphite V-grooves are secured by tightening two setscrews on the transfer insert.

Part Number	Description	Price	Availability
VHT1	**Transfer Clamp with Magnetic Lid for Fiber Holder Transfer Inserts**	**$225.00**	**Today**
VHG125L	**Extended Graphite V-Groove, Ø80 µm - Ø125 µm**	**$140.00**	**Today**
VHG200	**Graphite V-Groove, Ø150 µm - Ø200 µm**	**$130.00**	**Today**
VHG250	**Graphite V-Groove, Ø200 µm - Ø250 µm**	**$130.00**	**Today**
VHG300	**Graphite V-Groove, Ø250 µm - Ø300 µm**	**$130.00**	**Today**
VHG350	**Graphite V-Groove, Ø300 µm - Ø350 µm**	**$130.00**	**Today**
VHG400	**Graphite V-Groove, Ø350 µm - Ø400 µm**	**$130.00**	**Today**
VHG450	**Graphite V-Groove, Ø400 µm - Ø450 µm**	**$130.00**	**Today**
VHG500	**Graphite V-Groove, Ø450 µm - Ø500 µm**	**$130.00**	**Today**
VHG550	**Graphite V-Groove, Ø500 µm - Ø550 µm**	**$130.00**	**Today**

Replacement Diamond Cleave Blade

- Replacement Blade for Our Fiber Cleaving Systems (See List to the Right)
- 0.08" (2.0 mm) Long Diamond Blade
- User Installable

The ACL83 Diamond Cleave Blade is a replacement blade for the Vytran™ fiber processing systems listed to the right. Each system is shipped with a blade included.

Compatible Systems

- FPC200 Fiber Preparation Station
- CAC400 and CAC400A Fiber Cleavers
- LDC400 and LDC400A Fiber Cleavers
- GPX3800 and GPX3850 Automated Glass Processors with Cleavers
- FFS2000 and FFS2000PT Fiber Preparation and Splicing Workstations
- FFS2000PM and FFS2000WS Fiber Preparation, Splicing, and Proof Testing Workstations
- Former Generation LDC-200 Fiber Cleaver

When used with proper cleave parameters, a single location on the blade can provide up to 5,000 cleaves (dependent on the cladding properties of the fiber being cleaved). The blade can be positioned approximately 10 times before replacement (assuming proper cleave parameters and usage that does not cause unexpected damage to the blade). Blade replacement instructions for each system are provided in the user manuals.

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The blade is shipped in a protective covering.

Note: Severe damage to the blade can occur if conditions cause high stress perpendicular to the edge of the blade or if incorrect parameters are used to cleave the fiber.

Part Number	Description	Price	Availability
ACL83	**Replacement Diamond Cleave Blade**	**$600.00**	**Today**

Visit the *Vytran™ Fiber Cleavers for Ø80 µm to Ø1.25 mm Cladding Fibers* page for pricing and availability information:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=9352